Trajectory tracking of two wheels mobile robot using sliding mode control

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ABSTRACT
This paper deals with controller design of two wheels mobile robot system by using Sliding Mode Control. SMC controller is developed based on mathematical modeling of two wheels mobile robot model to control a stability of this system. Disturbance is applied to to test the balancing of the robot. The mathematical model of this robot which is highly nonlinear is derived. The final model is then represented in state space form using MATLAB/Simulink application. Simulation on MATLAB application is analyzed and the performance of position, speed, angle, and angle rate of the balancing robot are observed. The controllers that will be determined use both combination of Hierarchy Control method and Equivalence Control method. The deterministic approach is used to get the bounded condition value of the model for controller design purpose. Simulation result of comparison between SMC controller and Pole Placement controller is shown.

KEYWORDS:
Pole placement; Sliding Mode Control; Two Wheels Mobile Robot

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